



GMS Green Freight Initiative

Pilot projects to reduce GHG emissions from freight transport
in Lao PDR, Thailand and Viet Nam

Scoping report

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I. INTRODUCTION AND BACKGROUND

1. Economic corridors are being developed across the Greater Mekong Subregion (GMS) to improve transport connectivity, facilitate trade and economic development and boost regional cooperation. With initial road transport corridors almost complete, there is an increasing realization that the competitiveness of these corridors needs to be improved by increasing resource use efficiency and by reducing their impact on ecosystems and the environment. Increased traffic and development along these corridors is likely to result in increased greenhouse gas emissions and environmental changes. These need to be carefully managed to ensure environmental sustainability.

2. In order to address these issues, a feasibility assessment of 'Carbon Neutral Transport Corridors'¹ focusing on the GMS East-West Economic Corridor² was carried out under ADB's Core Environment Program – Biodiversity Conservation Corridors Initiative Phase 1. Based on recommendations from this study, pilot projects are being initiated to test green freight / low carbon interventions for freight operators in Lao PDR, Thailand and Viet Nam, under the ADB's Core Environment Program Phase 2. These will employ a capacity building approach for small and medium enterprises (SME's) which will help to increase the competitiveness of the freight sector. Pilot projects will focus on three areas to increase freight transport fuel efficiency and reduce GHG emissions from GMS corridors:

- a) Increasing access to finance for vehicle retrofit and new vehicle technologies
- b) Improving driver behavior and vehicle maintenance; and
- c) Improving logistics management and fleet utilization.

3. Two phases of consultations were held to conceptualize and identify implementing arrangements for these projects. Initial stakeholder consultations, consisting of one-on-one meetings and interviews, were carried out in June and July 2012 to build on the feasibility study results. These targeted transport, energy and environment ministries in each country, transport and logistics associations, vehicle manufacturing companies, and NGOs and universities working in the area of green transport. The results of these consultations were developed into a concept paper and draft investment road map. This was presented and discussed further in each country during scoping missions³ conducted in January and May 2013. A list of stakeholders consulted is given in Appendix 4.

4. This report outlines the scope of work to be carried out under the pilot projects and describes implementing arrangements both at a regional and national level. The first section outlines the rationale and context for the pilot projects, and following sections describe the project concept and implementing arrangements. Detailed activities and targets for each of the national projects are given in Appendices 1 to 3.

¹ <http://www.gms-eoc.org/resources/carbon-neutral-transport-corridors>

² <http://www.adb.org/projects/32105-013/main>

³ Each scoping mission included a half day workshop followed by one-on-one meetings with stakeholders.

II. RATIONALE AND CONTEXT

5. The freight and logistics sector in the GMS has played a pivotal role in supporting the significant expansion of trade in the last two decades, largely driven by rapid increases in exports. As a result, improving the performance of a country's logistics sector is important due to the strong links between economic development and logistics. Within this context the efficiency (including fuel efficiency) of freight movement is becoming increasingly important. A number of issues related to the efficiency of the sector are outlined below.

6. **Fragmented institutions and high fuel costs.** The freight sector in the Thailand, Lao PDR and Viet Nam is dominated by road transport - 84%, 79% and 71% (respectively) of freight tonnage was transported by road in 2009. The road freight transport industry is highly fragmented in all three countries with the majority of truck operators being classed as small and medium sized enterprises, and operating small fleets of less than 10 trucks⁴. Successive hikes in fuel costs, lower trading volumes, increased competition and system inefficiencies have led to increased transportation costs making it difficult for SME freight operators to realize a sustainable profit margin. Fuel costs make up between 40 – 60% of overall operating costs for road transport companies, and in turn result in high logistics costs in these countries. A large proportion of the operators in these countries (to a larger extent in Lao PDR and Viet Nam) continue to be fuel inefficient, lack logistics management skills and techniques, have a poor regard for safety and are capital deficient. Institutionally, there are strong industry and goods transport associations in Thailand (such as the Federation of Thai Industries, regional transport associations) and, to a lesser extent, in Viet Nam. However, these are still at a very initial stage in Lao PDR.

7. **Aging vehicles and inefficient use of fleets.** The sector is burdened by an ageing freight fleet most of which is well over 10 years on average, though this is more prevalent in Lao PDR and Viet Nam where the average age of the fleet is between 15-20 years⁵. The age of trucks in these countries in turn has a significant impact on the fuel efficiency of the freight sector in general. In Lao PDR and Viet Nam, the absence of any large truck manufacturing or assembly facilities and the high cost of new trucks have led to increased import of second hand trucks (less than 5 years old) from US, Korea and China. Companies surveyed during the EWEC feasibility study reported 25 – 50% of trips running empty which illustrates a clear mismatch of fleet and load carrying capacities. The situation is exacerbated by the overloading of vehicles as normal practice which increases fuel consumption and has implications for road safety and for the quality of road infrastructure. Fuel use is further increased by the prevalence of poor driving patterns such as speeding, idling and disregarding safe driving practices.

8. **Increasing greenhouse gas emissions.** Transport was responsible for 12% of global GHGs in 2007 and 9% of GHGs in the GMS in 2005⁶. The EWEC study showed that emissions from traffic on

⁴ GMS EOC, 2012. Carbon Neutral Transport Corridors: Reducing emissions from freight and forestry in the EWEC. Feasibility Study report.

⁵ Ibid footnote 3

⁶ Climate Analysis Indicators Tool (CAIT) Version 8.0 (Washington, DC; World Resources Institute, 2010)

the corridor were around 1.5 million tonnes CO₂ in 2010 - freight transport was seen to make up over 60% of emissions, even though freight travel activity was less than 30% of overall travel activity. Additionally, emissions from traffic on the corridor are projected to double to 3 million tonnes CO₂ by 2025, partially due to increased trade and development in corridor areas. Greenhouse gas emissions would be accompanied by other air pollutant emissions including particulate matter, nitrous oxide and black carbon, which in turn have ramifications for health. The study also illustrated that gradually increasing the fleet fuel efficiency by 15% has the potential to reduce 23% of cumulative corridor emissions by 2020 against a 2005 baseline or around 280,000 tonnes of CO₂ emissions per year on average. In order to ensure progress towards a greener economy, reducing fossil fuel use in the transport sector will be important for GMS countries both, to reduce fuel costs, and also, to reduce GHG emissions and air pollutants.

9. **Need for demonstration of green freight interventions.** Interventions addressing environmental and social impacts of freight transport are loosely becoming known as ‘green freight’ actions. There have been a number of such projects developed elsewhere in Asia, Europe and the US over the last decade, at different scales (regional and national), and driven by a range of stakeholders (e.g. government agencies, logistics companies, trucking associations, NGOs etc.). In order to develop a locally appropriate approach in the GMS, there is a need to develop an institutional framework in the road freight sector through by bundling access to finance, access to technologies and building driver and management capacity, within an enabling policy environment. As a first step, a pilot initiative on green freight is proposed that will be integrated or dovetailed with existing programs. Pilot projects will build on and link to government supported policy initiatives and project components of existing projects so that the interventions are mainstreamed into the national programs thereby ensuring their continuity and sustainability.

10. **Existing initiatives and institutions.** In Thailand, Lao PDR and Viet Nam, there is adequate policy support and awareness to develop interventions for the freight transport sector to improve fuel efficiency, reduce operating costs, and develop sustainable freight management systems. In Thailand, the Federation of Thai Industries’ Logistics Transport Management program is supporting fuel efficiency in freight transport companies with funding from the Ministry of Energy. The Department of Land Transport has also set up a quality standard (Q-Mark) for freight operators and established a knowledge hub for truck operators through the Thai Truck Center. In Lao PDR and Viet Nam, an ongoing project supported by the Government of Japan has tested the use of tachographs as a way of increasing safety parameters and fuel efficiency in trucks. It is essential to build on existing programs and develop an institutional framework so that the momentum is sustained and long-term efforts can be developed.

III. GMS GREEN FREIGHT INITIATIVE

11. The GMS Green Freight Initiative is a regional initiative to reduce greenhouse gas emissions from freight transport, being implemented under the GMS Core Environment Program⁷. The initiative

⁷ In 2005, the six countries along the Mekong River – Cambodia, PR China, Lao PDR, Myanmar, Thailand and Viet Nam – launched the Core Environment Program and Biodiversity Conservation Corridors Initiative (CEP-BCI) in response to growing concerns about the environmental impacts of rapid economic development. Administered by ADB and overseen by the

includes pilot / demonstration projects on green freight, and will test a decentralized model to deploy green freight interventions by building the capacity and knowledge of local associations in target provinces. Based on the lessons learned from the initiative, recommendations for how best practices can be replicated and scaled up will be made.

12. The initiative will include Lao PDR, Thailand and Viet Nam⁸, and activities will focus (where possible) on provinces related to the GMS East West Economic Corridor or other GMS corridors. The projects are also expected to support cross sector coordination by engaging energy, transport and environment agencies.

A. Aim and objectives

13. The aim of this initiative is to ‘reduce greenhouse gas emissions from freight transport’. The expected outcome from these projects is to ‘successfully test locally appropriate approaches to deploy fuel efficiency interventions in road freight companies’. The projects will focus on three main areas:

1. Increasing access to finance for vehicle retrofit and new vehicle technologies
2. Improving driver behavior and vehicle maintenance; and
3. Improving logistics management and fleet utilization.

B. Project components and activities

14. Activities will be implemented in one target province or region, in partnership with a local transport association. By building the capacity of local institutions (government, associations, and finance institutions), the project will enable freight companies to access finance, technology and capacity building to reduce fuel costs. The three project components and general activities under each are given in the following paragraphs. Country specific activities are described in Appendices 1 to 3.

1. Increasing access to finance for green technologies

15. One of the major issues affecting the efficiency of the freight sector is the prevalence of older vehicles - a survey of trucks along the EWEC showed that the difference in the fuel consumption of a 5 year old and 20 year old vehicle could be as much as 20%. Additionally, there are many green vehicle technologies⁹ that could be retrofitted to in-use national fleets to reduce fuel consumption. The main barrier facing companies is a lack of access to funds for green technologies and newer vehicles.

environment ministries of the six countries, the CEP-BCI aims to achieve “an environmentally friendly and climate resilient GMS ECP Program.” The CEP-BCI is coordinated by the Environment Operations Center (EOC), based at ADB’s Thailand Resident Mission in Bangkok, and is overseen by the GMS Working Group on Environment (WGE), comprising representatives from the environment ministries of each of the six GMS countries. CEP-BCI Phase 2 (2012 to 2016) covers four thematic components: 1. Environmental Planning, Safeguards, and Monitoring; 2. Biodiversity Landscapes and Livelihoods; 3. Climate Change; and 4. Institutions and Financing. See www.gms-eoc.org for more information.

⁸ These three countries were the focus of the earlier Carbon Neutral Transport Corridors feasibility study which has resulted in the initiation of the pilot projects.

⁹ There are many vehicle technologies available to improve the fuel efficiency of the in-use fleet, including: a) Tire technologies and aerodynamic equipment that reduce the resistance of the vehicle to either the road or wind which results in

16. Activities under this component will focus on designing and implementing a financing modality to deploy green freight technologies in a target province. A selection of green technologies will be tested to establish fuel and carbon savings in a local context, and fuel efficiency action plans will be prepared in consultation with SME trucking companies. Commercial banks and other financing institutions will be consulted to identify potential financing models that could be applied for the deployment of such technologies. Financing models (e.g. a revolving fund based in an association, incentives / subsidies for technologies) will be put in place to deploy green technologies among a sample of companies in a target province. The feasibility of up scaling and expanding this to include financing for new vehicles will also be identified. Activities to raise awareness of green technologies and their potential to reduce fuel costs will be carried out.

2. *Improving driver behaviour and vehicle maintenance*

17. Fuel efficient driving (i.e. eco-driving) focuses on optimizing the speed at which a vehicle is driven, acceleration practice, and idling-related practice to reduce the fuel consumption of the vehicle, and has been seen to result in savings in the range of 5-10%. Though all three countries have established policies and projects to test and promote eco-driving, there has been little widespread uptake or embedding in national certification systems. Activities under this component will focus on identifying best practice for eco-driving training, developing a standard training program for drivers in eco-driving training and road safety, building the capacity of driver trainers and identifying entry points in national driver certification systems for eco-driving.

3. *Improving logistics management and fleet utilization*

18. Logistics management strategies to reduce empty backhaul and increase the overall efficiency of trips made include managing loads better (i.e. to match the capacity of vehicles and optimize deliveries / pick-ups), optimizing the routes travelled to avoid delays and monitoring vehicles and driver behavior. Some of these can be implemented in house by enhancing the fleet management and monitoring capacity of staff, whereas (particularly for SMEs) the optimization of loads requires inter-company arrangements facilitated by a network of contacts. The system of a freight loads 'virtual clearing house' or platform where information on loads and clients can be exchanged is another potential way of optimizing deliveries / pick-ups.

19. Activities under this component will focus on identifying the barriers to fleet utilization in one province, and identify solutions by consulting with SME companies and relevant logistics experts. Logistics management solutions (e.g. software solutions) will be tested among a sample of companies to quantify fuel savings.

fuel savings. b) Technologies to reduce vehicle idling which help vehicle owners reduce fuel use while idling (e.g. at a border crossing or within city traffic) either by switching off engines or switching to an alternate power source.

IV. IMPLEMENTING ARRANGEMENTS

A. Regional coordination and project management

20. The Environment Operations Center (EOC) based in Bangkok will oversee implementation and monitor progress at a regional level. Pilot project results will be shared at GMS regional forums such as the GMS Working Group on Environment annual and semi-annual meetings, and the GMS Subregional Transport Forum, and international events. National project teams and stakeholders from each country will be brought together to share experiences annually.

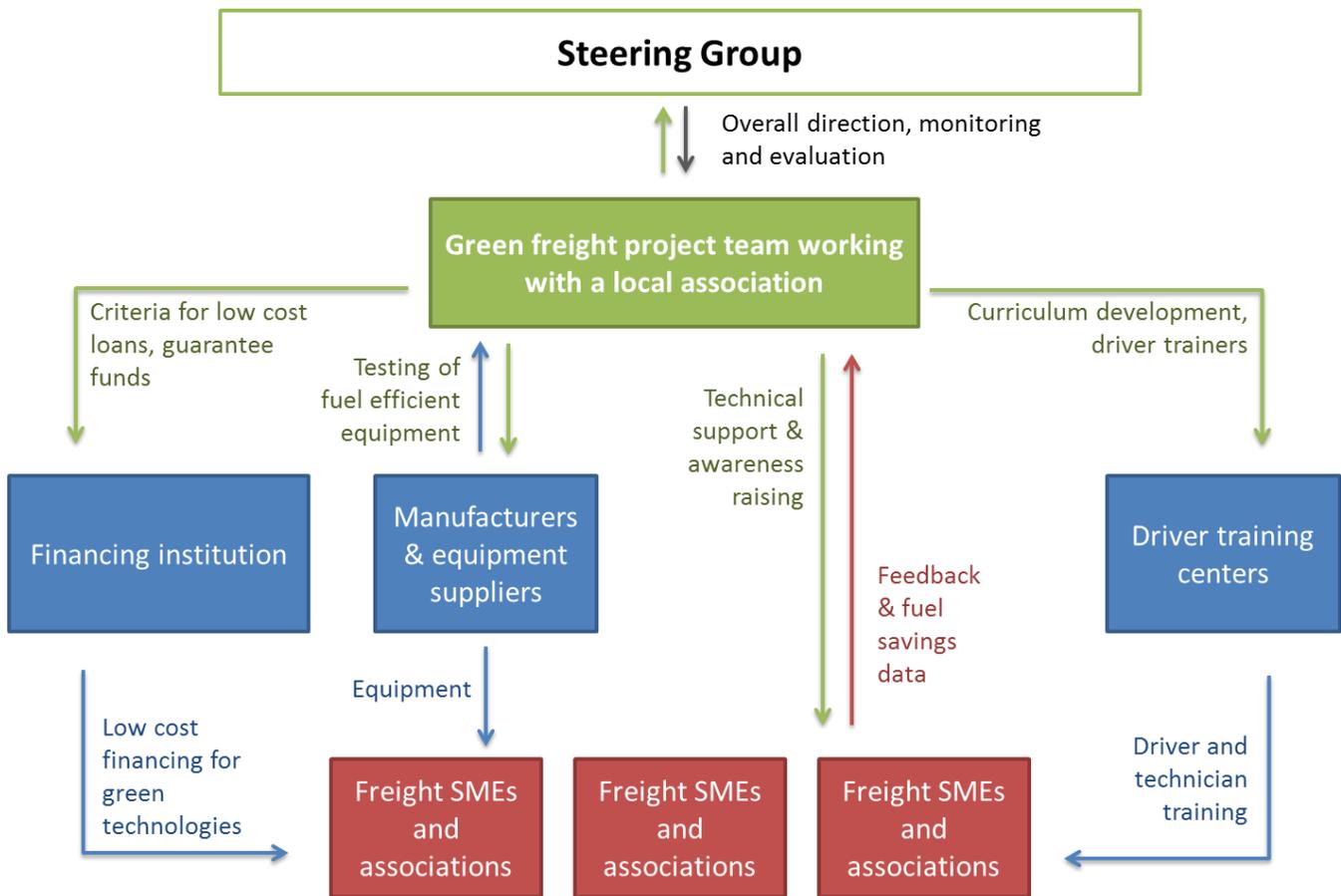
21. Regional experts Clean Air Asia will encourage exchange between the national projects, and will link with green freight projects in Asia and the Pacific (e.g. China Green Freight Initiative, Green Freight Asia Network etc.).

B. National project management

22. The national projects will be implemented under the guidance of the ministries of transport in each country (i.e. Ministry of Public Works and Transport, Lao PDR; Ministry of Transport, Thailand; and, Ministry of Transport, Viet Nam). As focal points to the overall GMS Core Environment Program, Working Group on Environment representative agencies in each country will coordinate with project focal points under the ministries of transport. At the national level, a project steering group will be set up (consisting of the ministries of transport, energy and environment, among others) to enable cross sector collaboration and discussion.

23. In order to implement the projects a project team will be located either with the ministry of transport or with a national association in each country. This team will identify and work with a local transport association to deploy green freight interventions among SME companies in the area. With support from the project team, the local association will be responsible for providing services to and liaising with freight companies. The project team will work with government agencies, associations and companies at a national level to create enabling conditions for future replication of the project. Local and regional experts will be engaged to ensure effectiveness of the project. A diagrammatic representation of the general set up in each country is shown in Figure 1.

Figure 1: Implementing arrangements for green freight pilot projects at a national level



24. Project teams will be contracted by ADB through its Consultant Management System and in accordance with procurement guidelines. Individual experts to support the design of particular components (e.g. financing modalities) will be contracted as required. Where needed, Letters of Agreement (LoAs) will be signed with national transport ministries to facilitate implementation of pilot projects.

C. Monitoring, reporting and outreach

25. It is likely that support for future scale up of green freight will require verifiable greenhouse gas emissions savings, and within this context, setting up robust and transparent project level monitoring will be important. Project monitoring will include both monitoring the effectiveness of the pilots overall, as well as monitoring comparative fuel and greenhouse gas emissions savings from different green freight interventions. Local and regional experts will be engaged to develop a monitoring framework as part of the initiation of the projects. An initial estimate of expected fuel and CO₂ reductions are given in Table 1 below.

Table 1: Expected benefits from pilot projects

Interventions	Estimated fuel savings	Estimated carbon reduction
Eco-driving training for drivers and	2,970,000 liters of diesel	7,960 tCO ₂

development of a regulatory / institutional mechanism for eco-driving		
Fuel efficient / green technologies pilot	3,815,000 liters of diesel	10,200 tCO ₂
Freight & logistics management systems pilot	295,000 liters of diesel	800 tCO ₂

26. The project monitoring system will be integrated into project reporting. Annual reports will be prepared at a regional level, based on six monthly progress reports from each national project. Existing sector institutional mechanisms and events will be targeted to increase awareness of the projects and of fuel efficiency in general (association annual meetings and publications, vehicle inspection and maintenance stations, driving schools, truck rest stops etc.). Implementing partner networks (universities, NGOs) will be utilized to raise national awareness of the activity. Lessons learned from sub-national pilots will be shared across the three countries through targeted regional exchange events (e.g. GMS Transport Forum, Working Group on Environment annual meetings, Environmentally Sustainable Transport Forum, Better Air Quality Conference).

D. Project phasing

27. The projects will be set up in three distinct phases between 2013 and 2016, as follows:

- Phase 1 - testing of interventions in small selection of companies to establish fuel savings (six months);
- Phase 2 - piloting of a financial mechanism to enable companies to buy technologies and engage in capacity building (12 months), and;
- Phase 3 - identifying opportunities to leverage finance to upscale pilots into a longer term program (6 months).

28. A parallel study will be carried out under GMS Core Environment Program to identify the feasibility of and requirements for up scaling these projects through emerging climate finance based instruments (e.g. Nationally Appropriate Mitigation Actions, other performance based financing instruments).

E. Budget estimates

29. The estimated budget for the initiative is 1,300,000 USD.

Appendix 1: LAO PDR GREEN FREIGHT PROJECT

A. Aim and objectives

The aim of this initiative is to ‘reduce greenhouse gas emissions from freight transport’. The expected outcome from these projects is to ‘successfully test locally appropriate approaches to deploy fuel efficiency interventions in road freight companies’. The projects will focus on three main areas:

1. Increasing access to finance for vehicle retrofit and new vehicle technologies;
2. Improving driver behavior and vehicle maintenance; and
3. Improving logistics management and fleet utilization.

B. Geographic scope and beneficiaries

The activity will focus (where possible) on provinces related to the GMS East West Economic Corridor or other GMS corridors. As the freight sector in Lao PDR is quite small, the project will focus on both freight transport companies as well as passenger transport companies (i.e. bus companies).

The projects will build the capacity of local institutions (government, associations, and finance institutions) to enable transport companies to access finance, technology and capacity building to reduce fuel costs. The projects are also expected to support cross sector coordination by engaging energy, transport and environment agencies.

C. Components and activities

Detailed activities that will be carried out in Lao PDR are shown in Table 2 below.

Table 2: Components and activities under the Lao PDR Green Freight project

Component	Activities	Outputs / targets
Increasing access to finance for green technologies	<p>The main activities to be carried out under this component are as follows:</p> <ul style="list-style-type: none"> • Development of inventory of green freight technologies • Testing of technologies among a selection of companies in a target province • Fuel audits / assessments with transport companies and development of action plans for fuel efficiency • Design and establishment of a financing instrument / incentive mechanism to encourage deployment of green freight technologies among companies in a target area • Monitoring of fuel and carbon savings • Awareness raising among transport companies about green freight and fuel efficiency • Review of financing arrangements for trucking companies to identify issues related to credit access for vehicle replacement • Design of national financing instrument to upgrade vehicle fleets 	<ul style="list-style-type: none"> • Inventory of existing FE technologies, suppliers and effectiveness • 3 SME companies / 10 trucks engaged in testing • Fuel audits conducted and action plans prepared for 10 companies • 20 SME companies participating in the pilot (i.e. using project incentives to invest in green technologies) • At least 10% FE increase in 70 trucks
Improving	The main activities to be carried out under this component are as	<ul style="list-style-type: none"> • Standard eco-driving

<p>driver behavior and vehicle maintenance</p>	<p>follows:</p> <ul style="list-style-type: none"> • Collation of best practice on eco-driving and driver safety training programs (e.g. manufacturer in-house programs; training offered in driver training schools, by bigger companies e.g. mining) • Development of standard eco-driving and driver safety training program through consultation with driver training stakeholders and in association with Thailand and Viet Nam green freight projects • Testing of standard driver training program among a selection of companies in target province • Capacity building and awareness raising of driver training schools on standard driver training program • Review of driver licensing systems in Lao PDR • Design of eco-driving certification program for Lao PDR <p>Transport operators participating in the program will be encouraged to participate in technologies / finance related activities. The <u>longer term</u> aim of this component will be to explore the potential to make such a program mandatory for all new drivers. The program could be a necessary addendum to the licensing requirements e.g. issuing of truck driver licenses could be tied into the completion of this training.</p>	<p>and safety training program prepared</p> <ul style="list-style-type: none"> • Training: 10 trainers; 100 drivers trained • At least 10% FE increase after training
<p>Improving logistics management and fleet utilization</p>	<p>The main activities to be carried out under this component are as follows:</p> <ul style="list-style-type: none"> • Review of issues related to empty backhaul in a target province • Development of summary of logistics management solutions for companies such as route rationalization, scheduling, matching load with vehicle size (payload management), capacity utilization, better, centralized record keeping functions providing vehicle service records, client and supplier data base, booking and delivery data, accounting and financial database • Testing of solutions (including software) in a set of companies and monitoring of results 	<ul style="list-style-type: none"> • 3 SME companies / 70 trucks engaged • At least 10% FE increase • Inventory of logistics management systems

D. Implementing arrangements

The Department of Transport under the Ministry of Public Works and Transport (MPWT) will be the focal agency for the Lao PDR Green Freight project. A Letter of Agreement will be signed with MPWT to support project implementation. A consulting firm (procured in accordance with ADB guidelines) will be engaged to provide technical inputs and will work with relevant divisions under the Department of Transport to implement the project. The project implementation team will include a coordinator / staff from MPWT supported by the consultant team.

The project implementation team will also coordinate and liaise with GMS Working Group on Environment focal point (Pollution Control Department, MONRE) and the National Support Unit.

The GMS Freight Transport Association (under the Lao National Chamber of Commerce and Industry and GMS Business Forum) will be a key project stakeholder helping to engage with companies in Lao

PDR. The project team will also work with the Lao International Freight Forwarders Association (LIFFA) and local level associations in relevant provinces. The projects will primarily target Small and Medium Enterprises (SMEs) engaging in goods transport and passenger transport. Fleets maintained by companies engaging in other business, such as agricultural or mining companies, will also be targeted.

A steering group will be set up at the national level to direct the project, record progress and monitor effectiveness in reducing fuel use and carbon emissions. The steering group will include MPWT, MONRE, EOC and expert advisers (e.g. Clean Air Asia, universities). The steering group will meet every six months.

An outreach and awareness campaign will be launched to create awareness amongst freight operators about the opportunities for fuel savings, options and technologies available. A seminar and workshop will be organized for select SME operators, transport and freight associations and other stakeholders to create awareness, disseminate knowledge and secure their interest. The event will be used to launch the Green Freight project and will also serve as an opportunity to obtain valuable feedback from the stakeholders and make program modifications if necessary.

Appendix 2: THAILAND GREEN FREIGHT PROJECT

A. Aim and objectives

The aim of this initiative is to ‘reduce greenhouse gas emissions from freight transport’. The expected outcome from these projects is to ‘successfully test locally appropriate approaches to deploy fuel efficiency interventions in road freight companies’. The projects will focus on three main areas:

1. Increasing access to finance for vehicle retrofit and new vehicle technologies;
2. Improving driver behavior and vehicle maintenance; and
3. Improving logistics management and fleet utilization.

B. Geographic scope and beneficiaries

The activity will focus (where possible) on provinces related to the GMS East West Economic Corridor or other GMS corridors. The projects will build the capacity of local institutions (government, associations, and finance institutions) to enable freight companies to access finance, technology and capacity building to reduce fuel costs. The project will engage and target one local / regional association that will be identified at the outset. The project team will implement activities in partnership with the target association so as to build their capacity and increase awareness of green freight. The projects are also expected to support cross sector coordination by engaging energy, transport and environment agencies.

The projects will primarily target Small and Medium Enterprises (SMEs) engaging in goods transport. Fleets maintained by companies engaging in other business, such as agricultural or manufacturing companies, will also be targeted.

C. Components and activities

Detailed activities that will be carried out in Thailand are shown in Table 3 below.

Table 3: Components and activities under the Thailand Green Freight project

Component	Activities	Outputs / targets
Increasing access to finance for green technologies	<p>The main activities to be carried out under this component are as follows:</p> <ul style="list-style-type: none">• Development of inventory of green freight technologies• Testing of technologies among a selection of companies in a target province• Fuel audits / assessments with freight companies and development of action plans for fuel efficiency• Review of financing arrangements for trucking companies to identify issues related to credit access• Dialogue and exchange events between financing institutions and freight companies• Awareness raising among transport companies about green freight and fuel efficiency	<ul style="list-style-type: none">• Inventory of existing FE technologies, suppliers and effectiveness• 3 SME companies / 10 trucks engaged in testing• Fuel audits conducted and action plans prepared for 10 companies
Improving	<p>The main activities to be carried out under this component are as</p>	<ul style="list-style-type: none">• Standard eco-driving and safety training

<p>driver behavior and vehicle maintenance</p>	<p>follows:</p> <ul style="list-style-type: none"> • Collation of best practice on eco-driving and driver safety training programs (e.g. HINO, ISUZU in-house programs; training offered in driver training schools) • Development of standard eco-driving and driver safety training program through consultation with driver training stakeholders (e.g. DLT, driving schools, manufacturers) and in association with Lao PDR and Viet Nam green freight projects • Testing of standard driver training program among a selection of companies in target province • Capacity building and awareness raising of driver training schools on standard driver training program • Review of driver licensing and driver training programs in Thailand • Design of eco-driving certification program for Thailand <p>Freight operators participating in the program will be encouraged to participate in technologies / finance related activities. The <u>longer term</u> aim of this component will be to explore the potential to make such a program mandatory for all new drivers. The program could be a necessary addendum to the licensing requirements e.g. issuing of truck driver licenses could be tied into the completion of this training.</p>	<p>program prepared</p> <ul style="list-style-type: none"> • Training: 10 trainers; 100 drivers trained • At least 10% FE increase after training
<p>Improving logistics management and fleet utilization</p>	<p>The main activities to be carried out under this component are as follows:</p> <ul style="list-style-type: none"> • Review of issues related to empty backhaul in a target province • Development of summary of logistics management solutions for companies such as route rationalization, scheduling, matching load with vehicle size (payload management), capacity utilization, better networking through the Thai Truck Center website, centralized record keeping functions providing vehicle service records, client and supplier data base, booking and delivery data, accounting and financial database • Testing of solutions in a set of companies and monitoring of results 	<ul style="list-style-type: none"> • 7 SME companies / 70 trucks engaged • At least 10% FE increase • Inventory of logistics management system

D. Implementing arrangements

The Office of Traffic and Transport Policy and Planning (OTP) under the Ministry of Transport will be the focal agency for the Thailand Green Freight project, and the project implementation team will work with the Department of Land Transport (DLT) to strengthen ongoing initiatives such as the Thai Truck Center.

The project will be implemented by the Federation of Thai Industries (Institute of Industrial Energy) and will build on the ongoing Logistics Transport Management project. A local level association will be identified through the Land Transport Federation of Thailand (e.g. Northeast Thailand Transport Association) and will be targeted to implement interventions and engage companies.

A steering group will be set up at the national level to direct the project, record progress and monitor effectiveness in reducing fuel use and carbon emissions. The steering group will include MoT (DLT,

OTP), Ministry of Energy (EPPO, DEDE), implementing partners (i.e. FTI), EOC and expert advisers (Clean Air Asia, University of Thai Chamber of Commerce). The steering group will meet every six months.

An outreach and awareness campaign will be launched to create awareness amongst freight operators about the opportunities for fuel savings, options and technologies available. A seminar and workshop will be organized for select SME operators, transport and freight associations and other stakeholders to create awareness, disseminate knowledge and secure their interest. The event will be used to launch the Green Freight project and will also serve as an opportunity to obtain valuable feedback from the stakeholders and make program modifications if necessary.

Appendix 3: VIET NAM GREEN FREIGHT PROJECT

A. Aim and objectives

The aim of this initiative is to ‘reduce greenhouse gas emissions from freight transport’. The expected outcome from these projects is to ‘successfully test locally appropriate approaches to deploy fuel efficiency interventions in road freight companies’. The projects will focus on three main areas:

1. Increasing access to finance for vehicle retrofit and new vehicle technologies;
2. Improving driver behavior and vehicle maintenance; and
3. Improving logistics management and fleet utilization.

B. Geographic scope and beneficiaries

The activity will focus (where possible) on provinces related to the GMS East West Economic Corridor or other GMS corridors. The projects will build the capacity of local institutions (government, associations, and finance institutions) to enable freight companies to access finance, technology and capacity building to reduce fuel costs. The project will engage and target one local / regional association that will be identified at the outset. The project team will implement activities in partnership with the target association so as to build their capacity and increase awareness of green freight. The projects are also expected to support cross sector coordination by engaging energy, transport and environment agencies.

The projects will primarily target Small and Medium Enterprises (SMEs) engaging in goods transport. Fleets maintained by companies engaging in other business, such as agricultural or manufacturing companies, will also be targeted.

C. Components and activities

Detailed activities that will be carried out in Viet Nam are shown in Table 3 below.

Table 4: Components and activities under the Viet Nam Green Freight project

Component	Activities	Outputs / targets
Increasing access to finance for green technologies	<p>The main activities to be carried out under this component are as follows:</p> <ul style="list-style-type: none">• Development of inventory of green freight technologies• Testing of technologies among a selection of companies in a target province in association with Viet Nam Register• Fuel audits / assessments with transport companies and development of action plans for fuel efficiency• Design and establishment of a financing instrument / incentive mechanism to encourage deployment of green freight technologies among companies in a target area• Monitoring of fuel and carbon savings• Awareness raising among transport companies about green freight and fuel efficiency• Review of financing arrangements for trucking companies to	<ul style="list-style-type: none">• Inventory of existing FE technologies, suppliers and effectiveness• 3 SME companies / 10 trucks engaged in testing• Fuel audits conducted and action plans prepared for 10 companies• 20 SME companies participating in the pilot (i.e. using project incentives to invest in green technologies)• At least 10% FE increase in 70 trucks

	<p>identify issues related to credit access for vehicle replacement</p> <ul style="list-style-type: none"> • Design of national financing instrument to upgrade vehicle fleets 	
Improving driver behavior and vehicle maintenance	<p>The main activities to be carried out under this component are as follows:</p> <ul style="list-style-type: none"> • Collation of best practice on eco-driving and driver safety training programs (e.g. manufacturer in-house programs; training offered in driver training schools) • Development of standard eco-driving and driver safety training program through consultation with driver training stakeholders and in association with Thailand and Lao PDR green freight projects • Testing of standard driver training program among a selection of companies in target province • Capacity building and awareness raising of driver training schools on standard driver training program • Review of driver licensing systems in Viet Nam • Design of eco-driving certification program for Viet Nam <p>Transport operators participating in the program will be encouraged to participate in technologies / finance related activities. The <u>longer term</u> aim of this component will be to explore the potential to make such a program mandatory for all new drivers. The program could be a necessary addendum to the licensing requirements e.g. issuing of truck driver licenses could be tied into the completion of this training.</p>	<ul style="list-style-type: none"> • Standard eco-driving and safety training program prepared • Training: 10 trainers; 100 drivers trained • At least 10% FE increase after training
Improving logistics management and fleet utilization	<p>The main activities to be carried out under this component are as follows:</p> <ul style="list-style-type: none"> • Review of issues related to empty backhaul in a target province • Development of summary of logistics management solutions for companies such as route rationalization, scheduling, matching load with vehicle size (payload management), capacity utilization, better, centralized record keeping functions providing vehicle service records, client and supplier data base, booking and delivery data, accounting and financial database • Testing of solutions (including software) in a set of companies and monitoring of results 	<ul style="list-style-type: none"> • 3 SME companies / 70 trucks engaged • At least 10% FE increase • Inventory of logistics management systems

D. Implementing arrangements

The Department of Roads of Viet Nam (DRVN) under the Ministry of Transport will be the focal agencies for the Viet Nam Green Freight project. The Department of Environment, MOT, and other transport agencies will be engaged through the project steering group.

A consulting firm (procured in accordance with ADB guidelines) will be engaged to provide technical inputs and will work with relevant departments under DRVN, which is responsible for overseeing freight company operations, and Viet Nam Register, which looks after vehicle registration, maintenance and licensing. The project implementation team will include a coordinator / staff from DRVN supported by

the consultant team. A Letter of Agreement will be signed with DRVN to support project implementation.

The project implementation team will also coordinate and liaise with GMS Working Group on Environment focal point (ISPONRE, MONRE).

The Viet Nam Automobile Transport Association (VATA) will be a key project stakeholder helping to engage with companies in Viet Nam. A local / province level association will be identified and will be targeted to implement interventions and engage companies. The projects will primarily target Small and Medium Enterprises (SMEs) engaging in goods transport. Fleets maintained by companies engaging in other business, such as agricultural or mining companies, will also be targeted.

A steering group will be set up at the national level to direct the project, record progress and monitor effectiveness in reducing fuel use and carbon emissions. The steering group will include MOT, MONRE, EOC and expert advisers (e.g. Clean Air Asia, Viet Nam Clean Air Partnership, universities). The steering group will meet every six months.

An outreach and awareness campaign will be launched to create awareness amongst freight operators about the opportunities for fuel savings, options and technologies available. A seminar and workshop will be organized for select SME operators, transport and freight associations and other stakeholders to create awareness, disseminate knowledge and secure their interest. The event will be used to launch the Green Freight project and will also serve as an opportunity to obtain valuable feedback from the stakeholders and make program modifications if necessary.

Appendix 4: STAKEHOLDERS CONSULTED DURING DESIGN OF PILOT PROJECTS

Contact person	Organization
THAILAND	
Ministry of Transport	
Somwung Thongkhao	Land Transport Safety Bureau, Department of Land Transport
Manop Khlaibundit	Freight Transport Bureau , Department of Land Transport
Rattana Iti-amorn	Freight Transport Bureau , Department of Land Transport
Malee Uabharadorn	Office of Transport and Traffic Planning
Chuthinthorn Praditphet	Office of Transport and Traffic Planning
Wipada Unlumert	Office of Transport and Traffic Planning
Ministry of Energy	
Prasert Sinsukprasert.	Department of Alternative Energy Development and Efficiency
Poolsak Puwavichrenchai	Energy Conservation Promotion Division, Department of Alternative Energy Development and Efficiency
Asawin Asawutmangkul	Department of Alternative Energy Development and Efficiency
Watcharin Boonyanit	Department of Alternative Energy Development and Efficiency
Yoo Chienyuenyongpong	The Land Transport Federation of Thailand
Ministry of Natural Resources and Environment	
Benya Suphanithasaporn	Office of International Cooperation on natural Resources and Environment
Ganda Piyatun	Office of Natural Resources and Environmental Policy and Planning
Woranuch Emmanoach	Office of Natural Resources and Environmental Policy and Planning
Varisara Chaiwong	Office of Natural Resources and Environmental Policy and Planning
Manwipar	Pollution Control Department
Janejab Suksod	Pollution Control Department
Siwaporn Rangsiyanon	Pollution Control Department
Associations and vehicle manufacturers	
Thibodee Harnprasert	The Institute of Industrial Energy, Federation of Thai Industries
Rattanapiman	The Institute of Industrial Energy, Federation of Thai Industries
Chalerm Sampantanarak	The Institute of Industrial Energy, Federation of Thai Industries
Techa Boonyachai	Thai National Shippers Council
Raksaphol Chansaeng, Section Manager, Planning & Research	Hino Motors Thailand
Yasa Okada, Senior Manager	Isuzu Thailand
VIET NAM	
Kim Thị Thúy Ngọc	Institute for Strategy and Policy on Natural Resources and Environment (ISPONRE)

Contact person	Organization
Nguyen Trung Thang	Institute for Strategy and Policy on Natural Resources and Environment (ISPONRE)
Ma. Hoang Hong Hanh	Institute for Strategy and Policy on Natural Resources and Environment (ISPONRE)
Nguyen Thi Nguyet Nga	Vice-Director, Department of Science, Technology and International Cooperation, Directorate for Road of Vietnam (DRVN)
Tran Thi Van	Department of Science, Technology and International Cooperation, Directorate for Road of Vietnam (DRVN)
Nguyen Duy Dung	Department of Science, Technology and International Cooperation, Directorate for Roads of Viet Nam (DRVN)
Nguyen Thi Phuong Hien	Director, Transport Development and Strategy Institute (TDSI)
Trịnh Thị Bích Thủy	Transport Development and Strategy Institute (TDSI)
Le Thi Thanh Nhan	Center of Resources & Environment, Transport Development and Strategy Institute (TDSI)
Phan Quynh Nhu	General Secretary, Viet Nam Clean Air Partnership (VCAP)
Chu Manh Hung	DG, Department of Environment, Ministry of Transport
Tran Anh Duong	Environment Department, Ministry of Transport (MOT)
Vu Hai Luu	Environment Department, Ministry of Transport (MOT)
Mai Van Hien	Environment Department, Ministry of Transport (MOT)
Nguyen Viet Cuong	Environment Department, Ministry of Transport (MOT)
Nguyen Trung Thanh	Environment Department, Ministry of Transport (MOT)
Mrs. Nguyen Thu Hang	Environment Department, Ministry of Transport (MOT)
Ngo Quang Tuan	International Cooperation Dept., Ministry of Transport (MOT)
Dang Thu Huong	International Cooperation Dept., Ministry of Transport (MOT)
Trinh Quang Trung	Transport Department, Ministry of Transport (MOT)
Do Cong Thuy	Transport Department, Ministry of Transport (MOT)
Le Duc Toan	Ministry of Transport (MOT)
Ngo Anh Tuan	Ministry of Transport (MOT)
Tran Tuan Anh	Science, Technology and Environment Department, Viet Nam Register, MOT
Nguyen Huu Tri	Deputy General Director, Viet Nam Register
Le Anh Tu	Director, Science, Technology and Environment Department, Viet Nam Register
Lao Thai Phong	Vehicle Inspection Department, Viet Nam Register
Nguyễn Đông Phong	Viet Nam Register (VR)
Huyen Nguyen Thi Thu	Institute of Energy, Ministry of Industry and Trade
Phan Quynh Nhu	General Secretary, Viet Nam Clean Air Partnership (VCAP)
Le Tuan	Hanoi University of Science and Technology (HUST)

Contact person	Organization
Ngo Quoc Trinh	University of Transport Technology
Nguyen Van Tuan	University of Transport Technology
Dr. Nguyen Hoang Vu	Military University
Nguyen Duc Tu	Quang Ninh pedagogical colleges
Lê Thị Thanh Huyền	ADB Viet Nam Resident Mission
Mitsutaka Otsu	Japan International Cooperation Agency (JICA)
Nguyen Khánh Toàn	General Secretary, Vietnam Motor Transport Association - VATA
Nguyen Manh Hung	Vietnam Motor Transport Association - VATA
Tran Nguyen Chau	Danatrans Group
Ho Dung	Dept. of logistics and development investment, Vietfrachtdad
Nguyen Trong Quy	Sales Department, Vietranstimex
Lao PDR	
Mr. Bouaphet SAYASANE	Public Work and Transport Department, Ministry of Public Work and Transport
Mr. Sengsavang PHANDANOUVONG	Public Work and Transport Department, Ministry of Public Work and Transport
Ms. Adisone SILAVONG	Public Work and Transport Department, Ministry of Public Work and Transport
Dr. Bounta ONNAVONG	Public Work and Transport Department, Ministry of Public Work and Transport
Mr. Bounsy DATHHAVONG	Department of Energy Management, Ministry of Energy and Mines
Mr. Bounkeut XOUAKO	Department of Import and Export, Ministry of Industry and Commerce
Ms. Bounphama Phothisane	Environment Protection Fund, Prime Minister's Office
Mr. Phongsavanh INTHAVONGSA	Faculty of Communication and transportation, National University of Laos
Associate Professor Kenchanh	Faculty of Science and Environment, National University of Laos
Mr. Oudet SOUVANNAVONG	GMS FRETA
Mr. Somphone PHASAVATH	GMS FRETA
Ms. Miyata	JICA
Mr. Anan VONTHYVONGSY	Lao State Land River
Mr. Khamfeuan KHAMMOUNTY	LIFFA
Ms. Mamyvone KHONGSAVANH	Department of Environment and Social Impact Assessment (ESIA), MoNRE
Mr. Chanthala Onephan	Department of Environment Quality Promotion, MoNRE
Mr. Thavone LATHTANA	Department of Planning, MoNRE
Mr. Anothai CHANTHALASY	Land Management Department, MoNRE

Contact person	Organization
Mr. Chanthavyphone INTHAVONG	Department of National Disaster Management and Climate Change, MoNRE
Mr. Heuan CHANPHANA	Pollution Control Department, MoNRE
Mr. Sounadeth SOUKCHALEUN	Pollution Control Department, MoNRE
Mr. Chalearnsai PANYANUVONG	Pollution Control Department, MoNRE
Mr. Khounsamay SILAPHET	Pollution Control Department, MoNRE
Mr. Lao Lor XAISUE	Pollution Control Department, MoNRE
Mr. Nakalin VORLASARN	Pollution Control Department, MoNRE
Mr. Vanthakone DEJVONGSA	Pollution Control Department, MoNRE
Mr. Vilayluk VIMALAVONG	Pollution Control Department, MoNRE
Ms. Amonelath MANIPHONH	Pollution Control Department, MoNRE
Ms. Kainakhone BOUNYANIT	Pollution Control Department, MoNRE
Ms. Phanthong VONGSAYA	Pollution Control Department, MoNRE
Ms. Touythida MOONTHICHIT	Pollution Control Department, MoNRE